transgenic tobacco plants.

Fig. 3 is a diagram of the construction of the scFv-antiBAS 490F.

C2 cont

Fig 4. shows the functional characterization of the scFv-antiBAS 490F in the direct ELISA.

Fig. 5 is a diagram of the cassette for seed-specific expression of the scFv-antiBAS 490F gene.

Fig. 6A shows the antigen binding activity of the scFv-antiBAS 490F polypeptide from fresh (1), lyophilized (2), and dried (3) leaves.

Fig. 6B shows the respective amounts of scFv-antiBAS 490F protein used for the ELISA analysis.--

IN THE CLAIMS

Please amend the claims as shown on the attached pages in both clean and marked-up versions.

REMARKS

Claims 29-36, 39 and 41-46 are pending.

Claims 29-36, 39 and 41-46 stand rejected under 35 U.S.C. 112, first paragraph. Applicants respectfully traverse this rejection.

It is necessary to distinguish between two systems used in the present invention to achieve a herbicide-resistant/-tolerant plant, namely an animal system and a plant system. Firstly, an animal, especially a vertebrate, is immunized with a chemical substance (herbicide) in the course of an immune answer. Following conventional practice, a monoclonal antibody is produced, e.g. in hybridoma cell lines. Further, the mRNA and subsequently the corresponding cDNA encoding the herbicide-specific antibody is isolated by conventional genetic methods. Secondly, the isolated gene (cDNA) encoding a herbicide-specific antibody is transformed into a plant thereby

conferring a herbicide-resistant/-tolerant plant.

Such a combination of methods of immunizing an animal with a herbicide together with methods of plant genetics to produce a herbicide-resistant or -tolerant plant is not known in the art and is therefore novel.

Further, the problem-solution approach of the present invention is not disclosed in the prior art. Thus, a process for the production of herbicide-resistant/-tolerant plants without any knowledge about the herbicidal targets, physiological or molecular details concerning the mechanism of herbicide action in plants, was not available in the prior art and is now provided through the present invention. Therefore, the present invention is new and also nonobvious.

The merit of the instant invention has rapidly pushed forward development in crop protection. Above all, this is because no genetic or physiological information about the herbicidal action is necessary in order to produce the instant herbicide-resistant/-tolerant plants. Consequently, the disclosure of the nucleotide sequences is not necessary to make use of the invention.

The Examiner focuses on the likelihood of reisolating a specific scFv encoding nucleotide sequence (Office action, page 4, last paragraph). However, while each scFv encoding nucleotide sequence itself is specific for only one herbicide, in general, any scFv encoding nucleotide produced by the present inventive process would work.

The present application discloses in detail the production of a single, specific, monoclonal antibody, e.g. a methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide or parts thereof, by using monoclonal cell lines (see specification page 5, lines 28-36). Thus the identification and isolation of genes encoding *all* peptides that bind BAS 490F is *not* necessary to practice the present invention.

The focus of the present invention is the unconventional method of isolating from an animal gene a sequence encoding an antibody which acts against herbicides in plants. Since the concrete steps of this novel way of producing herbicide resistant plants are disclosed in detail in the specification, the rejection under 35 U.S.C. first paragraph, should be withdrawn.

Claims 29-36, 42-44, 46 and 49-51 stand rejected under 35 U.S.C. 112, second paragraph. Applicants have amended the claims on most of the points noted by the Examiner. "Exogenous" in the sense of the present invention means that the herbicide-specific antibody, in a first step, was *not* produced in a plant, but outside of a plant, namely in an animal.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees to Deposit Account No. 11.0345. Please credit any excess fees to such deposit account.

Respectfully submitted,
KEIL & WEINKAUF

Jason D. Voight

Jason D. Voight
Reg. No. 42,205

1101 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 659-0100

Clean Version

29. (twice amended) A process for the production of a methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-tolerant plant, said process comprising transforming a plant with a gene encoding a methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide, whereby said polypeptide and the corresponding gene encoding said polypeptide is produced exogenously and isolated by the following steps:

C3

a) immunizing an animal with methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F) to produce a polyclonal serum of said polypeptide,

b) producing a monoclonal cell line to produce a specific, monoclonal methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide,

c) isolating the mRNA encoding said monoclonal polypeptide of step b) from said monoclonal cells and synthesizing the corresponding cDNA encoding said polypeptide.

30. (twice amended) The process as claimed in claim 29, wherein the methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide is a single-chain antibody fragment.

31. (twice amended) The process as claimed in claim 29, wherein the methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide is a complete antibody or a binding fragment of a complete antibody.

Sub D'

32. (twice amended) An expression cassette for plants, comprising a promoter, a nucleotide sequence encoding a signal peptide, a gene encoding an exogenous methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide or a part thereof produced according to steps a)-c) of claim 1, and a nucleotide sequence encoding an ER retention signal and a terminator.

33. (twice amended) The expression cassette as claimed in claim 32, wherein the promoter is constitutive.

34. (twice amended) The expression cassette as claimed in claim 32, wherein the gene encodes a single-chain antibody fragment.

35. (twice amended) The expression cassette as claimed in claim 32, wherein

the gene encodes a fusion protein comprising a methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide or a part thereof and at least one other functional protein or a part thereof selected from the group consisting of enzymes, toxins, chromophores and binding proteins.

C3 cont

36. (twice amended) The expression cassette as claimed in claim 32, wherein the gene is isolated from a hybridoma cell or with the aid of other recombinant methods.

39. (amended) A selection marker comprising the expression cassette as claimed in claim 32.

C4

41. (amended) A process for the transformation of a plant or cells of a plant, said process comprising introducing a gene sequence which encodes a methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide into the plant or the cells of the plant.

C5 Board Decision

42. (twice amended) The process as claimed in claim 41, wherein the introducing is effected by an *Agrobacterium*.

C6 Board Decision

43. (amended) The process as claimed in claim 41, wherein the introducing is effected by electroporation.

44. (amended) The process as claimed in claim 41, wherein the introducing is effected by the particle bombardment method.

C7 Board Decision

45. (amended) A process for production of a methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide, said process comprising transforming a plant or cells of a plant with a gene which encodes such a polypeptide and subsequently isolating the polypeptide.

46. (twice amended) A plant comprising the expression cassette as claimed in claim 33, wherein the expression cassette imparts increased tolerance to the plant, relative to a wild type or non-transformed plant, against methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F).

C8

49. (amended) The process as claimed in claim 41, wherein the gene sequence which encodes a methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide is part of an expression cassette which also comprises a signal peptide, an

C9 Board Decision

ER retention signal and a terminator.

C9 Board Cont Decision

50. (amended) The process as claimed in claim 42, wherein the *Agrobacterium* is of the species *Agrobacterium tumefaciens*.

51. (amended) The expression cassette as claimed in claim 33, wherein the constitutive promoter is the CaMV 35S promoter.

Marked-up Version

29. (twice amended) A process for the production of a methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-tolerant plant, said process comprising transforming a plant with a gene encoding [an exogenous] a methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide, whereby said polypeptide and the corresponding gene encoding said polypeptide is produced exogenously and isolated by the following steps:

a) immunizing an animal with methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F) to produce a polyclonal serum of said polypeptide,

b) producing a monoclonal cell line to produce a specific, monoclonal methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide,

c) isolating the mRNA encoding said monoclonal polypeptide of step b) from said monoclonal cells and synthesizing the corresponding cDNA encoding said polypeptide.

30. (twice amended) [A] The process as claimed in claim 29, wherein the [exogenous] methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide is a single-chain antibody fragment.

31. (twice amended) [A] The process as claimed in claim 29, wherein the [exogenous] methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide is a complete antibody or a binding fragment of a complete antibody.

32. (twice amended) An expression cassette for plants, comprising a promoter, a nucleotide sequence encoding a signal peptide, a gene encoding an exogenous methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide [(] or a part thereof [)] produced according to steps a)-c) of claim 1, and a nucleotide sequence encoding an ER retention signal and a terminator.

33. (twice amended) [An] The expression cassette as claimed in claim 32, wherein the promoter is constitutive.

34. (twice amended) [An] The expression cassette as claimed in claim 32, wherein the gene encodes a single-chain antibody fragment.

35. (twice amended) [An] The expression cassette as claimed in claim 32,

wherein the gene encodes a fusion protein comprising a methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide [(] or a part thereof [)] and at least one other functional protein [(] or a part thereof [)] selected from the group consisting of enzymes, toxins, chromophores and binding proteins.

36. (twice amended) [An] The expression cassette as claimed in claim 32, wherein the gene is isolated from a hybridoma cell or with the aid of other recombinant methods.

42. (twice amended) [A] The process as claimed in claim 41, wherein [transformation] the introducing is effected [with the aid of] by an *Agrobacterium*.

43. (amended) [A] The process as claimed in claim 41, wherein [transformation] the introducing is effected [with the aid of] by electroporation.

44. (amended) [A] The process as claimed in claim 41, wherein [transformation] the introducing is effected [with the aid of] by the particle bombardment method.

46. (twice amended) A plant comprising the expression cassette as claimed in claim 33, wherein the expression cassette imparts [improved] increased tolerance to the plant, relative to a wild type or non-transformed plant, against methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F).

49. (amended) [A] The process as claimed in claim 41, wherein the gene sequence which encodes a methyl methoxyimino-α-(o-tolyloxy)-o-tolylacetate (BAS 490F)-binding polypeptide is part of an expression cassette which also comprises a signal peptide, an ER retention signal and a terminator.

50. (amended) [A] The process as claimed in claim 42, wherein the *Agrobacterium* is of the species *Agrobacterium tumefaciens*.

51. (amended) [An] The expression cassette as claimed in claim 33, wherein the constitutive promoter is the CaMV 35S promoter.